

SEQUENCE LISTING

<110> Kukolj, George and Pause, Armin

<120> SELF REPLICATING RNA MOLECULE FROM
HEPATITIS C VIRUS

<130> 13/083-3-D2

<140> To be assigned

<141> 2002-12-04

<150> 60/257,857

<151> 2000-12-22

<160> 25

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tac	cgg	ggc	ctt	gat	gta	tcc	gtc	ata	cca	act	agc	gga	gac	gtc	att	3673	
Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val	Ile	Pro	Thr	Ser	Gly	Asp	Val	Ile		
	610					615					620						
gtc	gta	gca	acg	gac	gct	cta	atg	acg	ggc	ttt	acc	ggc	gat	ttc	gac	3721	
Val	Val	Ala	Thr	Asp	Ala	Leu	Met	Thr	Gly	Phe	Thr	Gly	Asp	Phe	Asp		
625					630					635					640		

tca	gtg	atc	gac	tgc	aat	aca	tgt	gtc	acc	cag	aca	gtc	gac	ttc	agc	3769
Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys	Val	Thr	Gln	Thr	Val	Asp	Phe	Ser	
				645					650					655		
ctg	gac	ccg	acc	ttc	acc	att	gag	acg	acg	acc	gtg	cca	caa	gac	gcg	3817
Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu	Thr	Thr	Thr	Val	Pro	Gln	Asp	Ala	
			660					665					670			
gtg	tca	cgc	tcg	cag	cgg	cga	ggc	agg	act	ggt	agg	ggc	agg	atg	ggc	3865
Val	Ser	Arg	Ser	Gln	Arg	Arg	Gly	Arg	Thr	Gly	Arg	Gly	Arg	Met	Gly	
		675					680					685				
att	tac	agg	ttt	gtg	act	cca	gga	gaa	cgg	ccc	tcg	ggc	atg	ttc	gat	3913
Ile	Tyr	Arg	Phe	Val	Thr	Pro	Gly	Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp	
	690					695					700					
tcc	tcg	gtt	ctg	tgc	gag	tgc	tat	gac	gcg	ggc	tgt	gct	tgg	tac	gag	3961
Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu	
705				710						715					720	
ctc	acg	ccc	gcc	gag	acc	tca	gtt	agg	ttg	cgg	gct	tac	cta	aac	aca	4009
Leu	Thr	Pro	Ala	Glu	Thr	Ser	Val	Arg	Leu	Arg	Ala	Tyr	Leu	Asn	Thr	
				725					730					735		
cca	ggg	ttg	ccc	gtc	tgc	cag	gac	cat	ctg	gag	ttc	tgg	gag	agc	gtc	4057
Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp	His	Leu	Glu	Phe	Trp	Glu	Ser	Val	
			740					745					750			
ttt	aca	ggc	ctc	acc	cac	ata	gac	gcc	cat	ttc	ttg	tcc	cag	act	aag	4105
Phe	Thr	Gly	Leu	Thr	His	Ile	Asp	Ala	His	Phe	Leu	Ser	Gln	Thr	Lys	
		755					760					765				
cag	gca	gga	gac	aac	ttc	ccc	tac	ctg	gta	gca	tac	cag	gct	acg	gtg	4153
Gln	Ala	Gly	Asp	Asn	Phe	Pro	Tyr	Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val	
	770					775					780					
tgc	gcc	agg	gct	cag	gct	cca	cct	cca	tcg	tgg	gac	caa	atg	tgg	aag	4201
Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	Pro	Ser	Trp	Asp	Gln	Met	Trp	Lys	
785				790						795					800	
tgt	ctc	ata	cgg	cta	aag	cct	acg	ctg	cac	ggg	cca	acg	ccc	ctg	ctg	4249
Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr	Leu	His	Gly	Pro	Thr	Pro	Leu	Leu	
				805					810					815		
tat	agg	ctg	gga	gcc	gtt	caa	aac	gag	gtt	act	acc	aca	cac	ccc	ata	4297
Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn	Glu	Val	Thr	Thr	Thr	His	Pro	Ile	
			820					825					830			
acc	aaa	tac	atc	atg	gca	tgc	atg	tcg	gct	gac	ctg	gag	gtc	gtc	acg	4345
Thr	Lys	Tyr	Ile	Met	Ala	Cys	Met	Ser	Ala	Asp	Leu	Glu	Val	Val	Thr	
		835					840					845				
agc	acc	tgg	gtg	ctg	gta	ggc	gga	gtc	cta	gca	gct	ctg	gcc	gcg	tat	4393
Ser	Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr	
	850					855					860					

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Cys Leu Thr Thr Gly Ser Val Val Ile Val Gly Arg Ile Ile Leu Ser	
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gga arg ccg gcc atc att ccc gac agg gaa gtc ctt tac cgg gag ttc	4489
Gly Xaa Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu Phe	
885 890 895	
gat gag atg gaa gag tgc gcc tca cac ctc cct tac atc gaa cag gga	4537
Asp Glu Met Glu Glu Cys Ala Ser His Leu Pro Tyr Ile Glu Gln Gly	
900 905 910	
atg cag ctc gcc gaa caa ttc aaa cag aag gca atc ggg ttg ctg caa	4585
Met Gln Leu Ala Glu Gln Phe Lys Gln Lys Ala Ile Gly Leu Leu Gln	
915 920 925	
aca gcc acc aag caa gcg gag gct gct gct ccc gtg gtg gaa tcc aag	4633
Thr Ala Thr Lys Gln Ala Glu Ala Ala Pro Val Val Glu Ser Lys	
930 935 940	
tgg cgg acc ctc gaa gcc ttc tgg gcg aag cat atg tgg aat ttc atc	4681
Trp Arg Thr Leu Glu Ala Phe Trp Ala Lys His Met Trp Asn Phe Ile	
945 950 955 960	
agc ggg ata caa tat tta gca ggc ttg tcc act ctg cct ggc aac ccc	4729
Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro	
965 970 975	
gcg ata gca tca ctg atg gca ttc aca gcc tct atc acc agc ccg ctc	4777
Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro Leu	
980 985 990	
acc acc caa cat acc ctc ctg ttt aac atc ctg ggg gga tgg gtg gcc	4825
Thr Thr Gln His Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala	
995 1000 1005	
gcc caa ctt gct cct ccc agc gct gct tct gct ttc gta ggc gcc ggc	4873
Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly	
1010 1015 1020	
atc gct gga gcg gct gtt ggc agc ata ggc ctt ggg aag gtg ctt gtg	4921
Ile Ala Gly Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val	
1025 1030 1035 1040	
gat att ttg gca ggt tat gga gca ggg gtg gca ggc gcg ctc gtg gcc	4969
Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala	
1045 1050 1055	
ttt aag gtc atg agc ggc gag atg ccc tcc acc gag gac ctg gtt aac	5017
Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn	
1060 1065 1070	
cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg	5065
Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val	

1075	1080	1085	
tgc gca gcg ata ctg cgt cgg cac gtg ggc cca ggg gag ggg gct gtg			5113
Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val			
1090	1095	1100	
cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc			5161
Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val			
1105	1110	1115	1120
tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act			5209
Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr			
	1125	1130	1135
cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac			5257
Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His			
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cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta			5305
Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu			
	1155	1160	1165
aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag acc			5353
Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Thr			
	1170	1175	1180
tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc			5401
Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe			
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tca tgt caa cgt ggg tac aag gga gtc tgg cgg ggc gac ggc atc atg			5449
Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met			
	1205	1210	1215
caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac			5497
Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn			
	1220	1225	1230
tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat			5545
Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His			
	1235	1240	1245
gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc			5593
Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser			
	1250	1255	1260
ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag			5641
Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu			
	1265	1270	1275
tac gtg gag gtt acg cgg gtg ggg gat ttc cac tac gtg acg ggc atg			5689
Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met			
	1285	1290	1295
acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc			5737

Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe	
1300 1305 1310	
ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc	5785
Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys	
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Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln	
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Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala	
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gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg	5929
Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr	
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Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser	
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Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr	
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Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp	
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cgg cag gag atg ggc ggg aac atc acc cgc gtg gag tca gaa aat aag	6121
Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys	
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Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu	
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Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe	
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Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu	
1475 1480 1485	
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Xaa Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly	
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Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg	
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aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg	6409
Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala	
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Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp	
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Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp	
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Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly	
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Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser	
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Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro	
1620 1625 1630	
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Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr	
1635 1640 1645	
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Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe	
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Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu	
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Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu	
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gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc	6937
Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly	
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Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His	
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Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile	
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Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu	
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Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly	
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Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu	
1780 1785 1790	
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Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly	
1795 1800 1805	
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Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro	
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Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu	
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Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala	
1845 1850 1855	
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Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile	
1860 1865 1870	
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Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg	
1875 1880 1885	
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Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr	
1890 1895 1900	
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Cys Tyr Leu Lys Ala Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp	
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Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser	
1925 1930 1935	
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1940 1945 1950	
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Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr	

1955	1960	1965	
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gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr 1985 1990 1995 2000			7801
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ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile 2050 2055 2060			7993
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gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala 2085 2090 2095			8089
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cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala 2115 2120 2125			8185
gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu 2130 2135 2140			8233
aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp 2145 2150 2155 2160			8281
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gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg			8377

Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val Gly
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Val Gly Ile Tyr Leu Leu Pro Asn Arg *
2195 2200

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Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu
35 40 45
Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val
50 55 60
Ile Leu Leu Thr Cys Ala Ile His Pro Glu Leu Ile Phe Thr Ile Thr
65 70 75 80
Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly
85 90 95
Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala
100 105 110
Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala
115 120 125
Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu
130 135 140
Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val
145 150 155 160
Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr
165 170 175
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro
180 185 190
Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser
195 200 205
Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser
210 215 220

Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly	Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly
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Arg	Asp	Arg	Asn	Gln	Val	Glu	Gly	Glu	Val	Gln	Val	Val	Ser	Thr	Ala
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Thr	Gln	Ser	Phe	Leu	Ala	Thr	Cys	Val	Asn	Gly	Val	Cys	Trp	Thr	Val
			260					265					270		
Tyr	His	Gly	Ala	Gly	Ser	Lys	Thr	Leu	Ala	Gly	Pro	Lys	Gly	Pro	Ile
		275					280					285			
Thr	Gln	Met	Tyr	Thr	Asn	Val	Asp	Gln	Asp	Leu	Val	Gly	Trp	Gln	Ala
		290				295					300				
Pro	Pro	Gly	Ala	Arg	Ser	Leu	Thr	Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp
305					310					315					320
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Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val	
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Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala	
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Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp	
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Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr	

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ctc acg ccc gcc gag acc tca gtt agg ttg cgg gct tac cta aac aca Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr 725 730 735			4009
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Thr	Lys	Tyr	Ile	Met	Ala	Cys	Met	Ser	Ala	Asp	Leu	Glu	Val	Val	Thr		
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Ser	Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr		
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Trp	Arg	Thr	Leu	Glu	Ala	Phe	Trp	Ala	Lys	His	Met	Trp	Asn	Phe	Ile		
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Thr	Thr	Gln	His	Thr	Leu	Leu	Phe	Asn	Ile	Leu	Gly	Gly	Trp	Val	Ala		
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gcc	caa	ctt	gct	cct	ccc	agc	gct	gct	tcc	gct	ttc	gta	ggc	gcc	ggc	4873	
Ala	Gln	Leu	Ala	Pro	Pro	Ser	Ala	Ala	Ser	Ala	Phe	Val	Gly	Ala	Gly		
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Ile	Ala	Gly	Ala	Ala	Val	Gly	Ser	Ile	Gly	Leu	Gly	Lys	Val	Leu	Val		
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Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn	
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Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val	
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Cys Ala Ala Ile Leu Arg His Val Gly Pro Gly Glu Gly Ala Val	
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Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val	
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Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr	
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Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His	
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Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met	
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Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn	
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Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His	
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Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser	
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Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu	
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Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu	

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Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro	
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Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala	
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Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile	
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Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr	
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Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala	
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c atg gac	cgg gag atg	gca gca tgc	tgc gga ggc	gcg gtt ttc	gta ggt	1849
Met Asp Arg	Glu Met Ala	Ala Ser Cys	Gly Gly Ala	Val Phe Val	Gly	
1	5	10	15			
ctg ata ctc	ttg acc ttg	tca ccg cac	tat aag ctg	ttc ctc gct	agg	1897
Leu Ile Leu	Leu Thr Leu	Ser Pro His	Tyr Lys Leu	Phe Leu Ala	Arg	
	20	25	30			
ctc ata tgg	tgg tta caa	tat ttt atc	acc agg gcc	gag gca cac	ttg	1945
Leu Ile Trp	Trp Leu Gln	Tyr Phe Ile	Thr Arg Ala	Glu Ala His	Leu	
	35	40	45			
caa gtg tgg	atc ccc ccc	ctc aac gtt	cgg ggg ggc	cgc gat gcc	gtc	1993
Gln Val Trp	Ile Pro Pro	Leu Asn Val	Arg Gly Gly	Arg Asp Ala	Val	
	50	55	60			
atc ctc ctc	acg tgc gcg	atc cac cca	gag cta atc	ttt acc atc	acc	2041
Ile Leu Leu	Thr Cys Ala	Ile His Pro	Glu Leu Ile	Phe Thr Ile	Thr	
	65	70	75		80	
aaa atc ttg	ctc gcc ata	ctc ggt cca	ctc atg gtg	ctc cag gct	ggt	2089
Lys Ile Leu	Leu Ala Ile	Leu Gly Pro	Leu Met Val	Leu Gln Ala	Gly	
	85	90	95			
ata acc aaa	gtg ccg tac	ttc gtg cgc	gca cac ggg	ctc att cgt	gca	2137
Ile Thr Lys	Val Pro Tyr	Phe Val Arg	Ala His Gly	Leu Ile Arg	Ala	
	100	105	110			
tgc atg ctg	gtg cgg aag	gtt gct ggg	ggt cat tat	gtc caa atg	gct	2185
Cys Met Leu	Val Arg Lys	Val Ala Gly	Gly Gly His	Tyr Val Gln	Met Ala	
	115	120	125			
ctc atg aag	ttg gcc gca	ctg aca ggt	acg tac gtt	tat gac cat	ctc	2233
Leu Met Lys	Leu Ala Ala	Leu Thr Gly	Thr Tyr Val	Tyr Asp His	Leu	
	130	135	140			
acc cca ctg	cgg gac tgg	gcc cac gcg	ggc cta cga	gac ctt gcg	gtg	2281
Thr Pro Leu	Arg Asp Trp	Ala His Ala	Gly Leu Arg	Asp Leu Ala	Val	
	145	150	155		160	
gca gtt gag	ccc gtc gtc	ttc tct gat	atg gag acc	aag gtt atc	acc	2329
Ala Val Glu	Pro Val Val	Phe Ser Asp	Met Glu Thr	Lys Val Ile	Thr	
	165	170	175			
tgg ggg gca	gac acc gcg	gcg tgt ggg	gac atc atc	ttg ggc ctg	ccc	2377
Trp Gly Ala	Asp Thr Ala	Ala Cys Gly	Asp Ile Ile	Leu Gly Leu	Pro	
	180	185	190			

gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc	2425
Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser	
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Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser	
210 215 220	
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Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly	
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Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala	
245 250 255	
aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc	2617
Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val	
260 265 270	
tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc	2665
Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile	
275 280 285	
acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg	2713
Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala	
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Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp	
305 310 315 320	
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Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg	
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Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu	
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Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val	
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Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val	
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Asp Phe Val Pro Val Glu Ser Met Gly Thr Thr Met Arg Ser Pro Val	
385 390 395 400	
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Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val	
405 410 415	

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Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro	
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Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser	
435 440 445	
gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt	3193
Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly	
450 455 460	
atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt gcc	3241
Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala	
465 470 475 480	
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Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys	
485 490 495	
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Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr	
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Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu	
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Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly	
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Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser	
545 550 555 560	
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Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile	
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Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp	
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Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr	
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Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile	
610 615 620	
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Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp	

625						630						635						640	
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Ser Val Ile Asp						Cys Asn Thr Cys Val				Thr Gln Thr Val Asp						Phe Ser			
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ctg gac ccg acc ttc acc att gag acg acc gtc cca caa gac gcg																	3817		
Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Thr Val Pro Gln Asp Ala																			
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gtg tca cgc tcg cag cgg cga ggc agg act ggt agg ggc agg atg ggc																	3865		
Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met Gly																			
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att tac agg ttt gtg act cca gga gaa cgg ccc tcg ggc atg ttc gat																	3913		
Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp																			
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tcc tcg gtt ctg tgc gag tgc tat gac gcg ggc tgt gct tgg tac gag																	3961		
Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu																			
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ctc acg ccc gcc gag acc tca gtt agg ttg cgg gct tac cta aac aca																	4009		
Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr																			
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cca ggg ttg ccc gtc tgc cag gac cat ctg gag ttc tgg gag agc gtc																	4057		
Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Ser Val																			
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Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys																			
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cag gca gga gac aac ttc ccc tac ctg gta gca tac cag gct acg gtg																	4153		
Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val																			
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Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp Lys																			
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Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu																			
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tat agg ctg gga gcc gtt caa aac gag gtt act acc aca cac ccc ata																	4297		
Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr Thr His Pro Ile																			
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acc aaa tac atc atg gca tgc atg tcg gct gac ctg gag gtc gtc acg																	4345		
Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val Thr																			
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agc acc tgg gtg ctg gta ggc gga gtc cta gca gct ctg gcc gcg tat																	4393		

Ser	Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr	
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tgc	ctg	aca	aca	ggc	agc	gtg	gtc	att	gtg	ggc	agg	atc	atc	ttg	tcc	4441
Cys	Leu	Thr	Thr	Gly	Ser	Val	Val	Ile	Val	Gly	Arg	Ile	Ile	Leu	Ser	
865					870					875					880	
gga	aag	ccg	gcc	atc	att	ccc	gac	agg	gaa	gtc	ctt	tac	cgg	gag	ttc	4489
Gly	Lys	Pro	Ala	Ile	Ile	Pro	Asp	Arg	Glu	Val	Leu	Tyr	Arg	Glu	Phe	
				885					890					895		
gat	gag	atg	gaa	gag	tgc	gcc	tca	cac	ctc	cct	tac	atc	gaa	cag	gga	4537
Asp	Glu	Met		Glu	Cys	Ala	Ser	His	Leu	Pro	Tyr	Ile	Glu	Gln	Gly	
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atg	cag	ctc	gcc	gaa	caa	ttc	aaa	cag	aag	gca	atc	ggg	ttg	ctg	caa	4585
Met	Gln	Leu	Ala	Glu	Gln	Phe	Lys	Gln	Lys	Ala	Ile	Gly	Leu	Leu	Gln	
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aca	gcc	acc	aag	caa	gcg	gag	gct	gct	gct	ccc	gtg	gtg	gaa	tcc	aag	4633
Thr	Ala	Thr	Lys	Gln	Ala	Glu	Ala	Ala	Ala	Pro	Val	Val	Glu	Ser	Lys	
	930					935					940					
tgg	cgg	acc	ctc	gaa	gcc	ttc	tgg	gcg	aag	cat	atg	tgg	aat	ttc	atc	4681
Trp	Arg	Thr	Leu	Glu	Ala	Phe	Trp	Ala	Lys	His	Met	Trp	Asn	Phe	Ile	
945					950					955					960	
agc	ggg	ata	caa	tat	tta	gca	ggc	ttg	tcc	act	ctg	cct	ggc	aac	ccc	4729
Ser	Gly	Ile	Gln	Tyr	Leu	Ala	Gly	Leu	Ser	Thr	Leu	Pro	Gly	Asn	Pro	
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gcg	ata	gca	tca	ctg	atg	gca	ttc	aca	gcc	tct	atc	acc	agc	ccg	ctc	4777
Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala	Ser	Ile	Thr	Ser	Pro	Leu	
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acc	acc	caa	cat	acc	ctc	ctg	ttt	aac	atc	ctg	ggg	gga	tgg	gtg	gcc	4825
Thr	Thr	Gln	His	Thr	Leu	Leu	Phe	Asn	Ile	Leu	Gly	Gly	Trp	Val	Ala	
		995				1000					1005					
gcc	caa	ctt	gct	cct	ccc	agc	gct	gct	tct	gct	ttc	gta	ggc	gcc	ggc	4873
Ala	Gln	Leu	Ala	Pro	Pro	Ser	Ala	Ala	Ser	Ala	Phe	Val	Gly	Ala	Gly	
	1010					1015					1020					
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Ile	Ala	Gly	Ala	Ala	Val	Gly	Ser	Ile	Gly	Leu	Gly	Lys	Val	Leu	Val	
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gat	att	ttg	gca	ggt	tat	gga	gca	ggg	gtg	gca	ggc	gcg	ctc	gtg	gcc	4969
Asp	Ile	Leu	Ala	Gly	Tyr	Gly	Ala	Gly	Val	Ala	Gly	Ala	Leu	Val	Ala	
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Phe	Lys	Val	Met	Ser	Gly	Glu	Met	Pro	Ser	Thr	Glu	Asp	Leu	Val	Asn	
			1060					1065					1070			

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Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val	
1075 1080 1085	
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Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val	
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Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val	
1105 1110 1115 1120	
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Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr	
1125 1130 1135	
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Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His	
1140 1145 1150	
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Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu	
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aga gat gtt tgg gat tgg gta tgc acg gtg ttg act gat ttc aag acc	5353
Arg Asp Val Trp Asp Trp Val Cys Thr Val Leu Thr Asp Phe Lys Thr	
1170 1175 1180	
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Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe	
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Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met	
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Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn	
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Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His	
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Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser	
1250 1255 1260	
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Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu	
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Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met	
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Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe	
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Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys	
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Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln	
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Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala	
1345 1350 1355 1360	
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Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr	
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Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser	
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Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr	
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Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp	
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cgg cag gag atg ggc ggg aac atc acc cgc gtg gag tca gaa aat aag	6121
Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys	
1425 1430 1435 1440	
gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag	6169
Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu	
1445 1450 1455	
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Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe	
1460 1465 1470	
cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg	6265
Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu	
1475 1480 1485	
tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg	6313
Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly	
1490 1495 1500	
tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca cgg agg	6361
Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg	

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Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala	1525	1530	1535	
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac				6457
Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp	1540	1545	1550	
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Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp	1555	1560	1565	
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Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly	1570	1575	1580	
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Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser	1585	1590	1595 1600	
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Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp	1605	1610	1615	
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Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro	1620	1625	1630	
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Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr	1635	1640	1645	
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Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe	1650	1655	1660	
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Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu	1665	1670	1675 1680	
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Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu	1685	1690	1695	
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc				6937
Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly	1700	1705	1710	
tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac				6985
Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His	1715	1720	1725	
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att				7033

Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile	
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Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu	
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aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg	7129
Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly	
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gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc	7177
Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu	
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cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga	7225
Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly	
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cag cgg gtc gag ttc ctg gtg aat gct tgg aaa gcg aag aaa tgc cct	7273
Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro	
1810	1815 1820
atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag	7321
Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu	
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aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc	7369
Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala	
1845	1850 1855
ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc	7417
Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile	
1860	1865 1870
ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg	7465
Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg	
1875	1880 1885
tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca	7513
Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr	
1890	1895 1900
tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac	7561
Cys Tyr Leu Lys Ala Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp	
1905	1910 1915 1920
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Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser	
1925	1930 1935
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Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala	
1940	1945 1950

atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa tac	7705
Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr	
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Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His	
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Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr	
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Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg	
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Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln	
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ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att	7993
Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile	
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Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser	
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Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala	
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Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His	
2100 2105 2110	
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Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala	
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gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc	8233
Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu	
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Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp	
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Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg	
2165 2170 2175	

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Leu	Ile	Leu	Leu	Thr	Leu	Ser	Pro	His	Tyr	Lys	Leu	Phe	Leu	Ala	Arg	
			20					25					30			
ctc	ata	tgg	tgg	tta	caa	tat	ttt	atc	acc	agg	gcc	gag	gca	cac	ttg	1945
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Lys	Ile	Leu	Leu	Ala	Ile	Leu	Gly	Pro	Leu	Met	Val	Leu	Gln	Ala	Gly	
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Cys	Met	Leu	Val	Arg	Lys	Val	Ala	Gly	Gly	His	Tyr	Val	Gln	Met	Ala	
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ctc	atg	aag	ttg	gcc	gca	ctg	aca	ggt	acg	tac	gtt	tat	gac	cat	ctc	2233
Leu	Met	Lys	Leu	Ala	Ala	Leu	Thr	Gly	Thr	Tyr	Val	Tyr	Asp	His	Leu	
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Thr	Pro	Leu	Arg	Asp	Trp	Ala	His	Ala	Gly	Leu	Arg	Asp	Leu	Ala	Val	
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Ala	Val	Glu	Pro	Val	Val	Phe	Ser	Asp	Met	Glu	Thr	Lys	Val	Ile	Thr	
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tgg	ggg	gca	gac	acc	gcg	gcg	tgt	ggg	gac	atc	atc	ttg	ggc	ctg	ccc	2377
Trp	Gly	Ala	Asp	Thr	Ala	Ala	Cys	Gly	Asp	Ile	Ile	Leu	Gly	Leu	Pro	
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gtc	tcc	gcc	cgc	agg	ggg	agg	gag	ata	cat	ctg	gga	ccg	gca	gac	agc	2425
Val	Ser	Ala	Arg	Arg	Gly	Arg	Glu	Ile	His	Leu	Gly	Pro	Ala	Asp	Ser	
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Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val	
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Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile	
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785				790					795						800			
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Cys	Leu	Thr	Thr	Gly	Ser	Val	Val	Ile	Val	Gly	Arg	Ile	Ile	Leu	Ser			
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Gly	Lys	Pro	Ala	Ile	Ile	Pro	Asp	Arg	Glu	Val	Phe	Tyr	Arg	Glu	Phe		
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Asp	Glu	Met	Glu	Glu	Cys	Ala	Ser	His	Leu	Pro	Tyr	Ile	Glu	Gln	Gly		
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Gln	Val	Trp	Ile	Pro	Pro	Leu	Asn	Val	Arg	Gly	Gly	Arg	Asp	Ala	Val	
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atc	ctc	ctc	acg	tgc	gcg	atc	cac	cca	gag	cta	atc	ttt	acc	atc	acc	2041
Ile	Leu	Leu	Thr	Cys	Ala	Ile	His	Pro	Glu	Leu	Ile	Phe	Thr	Ile	Thr	
65					70				75						80	
aaa	atc	ttg	ctc	gcc	ata	ctc	ggt	cca	ctc	atg	gtg	ctc	cag	gct	ggt	2089
Lys	Ile	Leu	Leu	Ala	Ile	Leu	Gly	Pro	Leu	Met	Val	Leu	Gln	Ala	Gly	
				85				90						95		
ata	acc	aaa	gtg	ccg	tac	ttc	gtg	cgc	gca	cac	ggg	ctc	att	cgt	gca	2137
Ile	Thr	Lys	Val	Pro	Tyr	Phe	Val	Arg	Ala	His	Gly	Leu	Ile	Arg	Ala	
		100						105					110			
tgc	atg	ctg	gtg	cgg	aag	gtt	gct	ggg	ggt	cat	tat	gtc	caa	atg	gct	2185
Cys	Met	Leu	Val	Arg	Lys	Val	Ala	Gly	Gly	His	Tyr	Val	Gln	Met	Ala	
		115					120					125				
ctc	atg	aag	ttg	gcc	gca	ctg	aca	ggt	acg	tac	gtt	tat	gac	cat	ctc	2233
Leu	Met	Lys	Leu	Ala	Ala	Leu	Thr	Gly	Thr	Tyr	Val	Tyr	Asp	His	Leu	
	130					135					140					
acc	cca	ctg	cgg	gac	tgg	gcc	cac	gcg	ggc	cta	cga	gac	ctt	gcg	gtg	2281
Thr	Pro	Leu	Arg	Asp	Trp	Ala	His	Ala	Gly	Leu	Arg	Asp	Leu	Ala	Val	
145					150					155					160	
gca	gtt	gag	ccc	gtc	gtc	ttc	tct	gat	atg	gag	acc	aag	gtt	atc	acc	2329
Ala	Val	Glu	Pro	Val	Val	Phe	Ser	Asp	Met	Glu	Thr	Lys	Val	Ile	Thr	
			165					170						175		
tgg	ggg	gca	gac	acc	gcg	gcg	tgt	ggg	gac	atc	atc	ttg	ggc	ctg	ccc	2377
Trp	Gly	Ala	Asp	Thr	Ala	Ala	Cys	Gly	Asp	Ile	Ile	Leu	Gly	Leu	Pro	
			180					185					190			
gtc	tcc	gcc	cgc	agg	ggg	agg	gag	ata	cat	ctg	gga	ccg	gca	gac	agc	2425
Val	Ser	Ala	Arg	Arg	Gly	Arg	Glu	Ile	His	Leu	Gly	Pro	Ala	Asp	Ser	
		195					200					205				
ctt	gaa	ggg	cag	ggg	tgg	cga	ctc	ctc	gcg	cct	att	acg	gcc	tac	tcc	2473
Leu	Glu	Gly	Gln	Gly	Trp	Arg	Leu	Leu	Ala	Pro	Ile	Thr	Ala	Tyr	Ser	
	210					215					220					
caa	cag	acg	cga	ggc	cta	ctt	ggc	tgc	atc	atc	acc	agc	ctc	aca	ggc	2521
Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly	Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	
225					230					235					240	
cgg	gac	agg	aac	cag	gtc	gag	ggg	gag	gtc	caa	gtg	gtc	tcc	acc	gca	2569
Arg	Asp	Arg	Asn	Gln	Val	Glu	Gly	Glu	Val	Gln	Val	Val	Ser	Thr	Ala	
				245					250					255		

aca	caa	tct	ttc	ctg	gcg	acc	tgc	gtc	aat	ggc	gtg	tgt	tgg	act	gtc	2617
Thr	Gln	Ser	Phe	Leu	Ala	Thr	Cys	Val	Asn	Gly	Val	Cys	Trp	Thr	Val	
			260					265					270			
tat	cat	ggg	gcc	ggc	tca	aag	acc	ctt	gcc	ggc	cca	aag	ggc	cca	atc	2665
Tyr	His	Gly	Ala	Gly	Ser	Lys	Thr	Leu	Ala	Gly	Pro	Lys	Gly	Pro	Ile	
		275					280					285				
acc	caa	atg	tac	acc	aat	gtg	gac	cag	gac	ctc	gtc	ggc	tgg	caa	gcg	2713
Thr	Gln	Met	Tyr	Thr	Asn	Val	Asp	Gln	Asp	Leu	Val	Gly	Trp	Gln	Ala	
	290					295					300					
ccc	ccc	ggg	gcg	cgt	tcc	ttg	aca	cca	tgc	acc	tgc	ggc	agc	tcg	gac	2761
Pro	Pro	Gly	Ala	Arg	Ser	Leu	Thr	Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp	
305					310					315					320	
ctt	tac	ttg	gtc	acg	aag	cat	gcc	gat	gtc	att	ccg	gtg	cgc	cgg	cgg	2809
Leu	Tyr	Leu	Val	Thr	Lys	His	Ala	Asp	Val	Ile	Pro	Val	Arg	Arg	Arg	
				325					330					335		
ggc	gac	agc	agg	ggg	agc	cta	ctc	tcc	ccc	cgg	ccc	gtc	tcc	tac	ttg	2857
Gly	Asp	Ser	Arg	Gly	Ser	Leu	Leu	Ser	Pro	Arg	Pro	Val	Ser	Tyr	Leu	
			340					345					350			
aag	ggc	tct	tcg	ggc	ggg	cca	ctg	ctc	tgc	ccc	tcg	ggg	cac	gct	gtg	2905
Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu	Leu	Cys	Pro	Ser	Gly	His	Ala	Val	
		355					360					365				
ggc	atc	ttt	cgg	gct	gcc	gtg	tgc	acc	cga	ggg	gtt	gcg	aag	gcg	gtg	2953
Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys	Thr	Arg	Gly	Val	Ala	Lys	Ala	Val	
	370					375					380					
gac	ttt	gta	ccc	gtc	gag	tct	atg	gaa	acc	act	atg	cgg	tcc	ccg	gtc	3001
Asp	Phe	Val	Pro	Val	Glu	Ser	Met	Glu	Thr	Thr	Met	Arg	Ser	Pro	Val	
385					390					395					400	
ttc	acg	gac	aac	tcg	tcc	cct	ccg	gcc	gta	ccg	cag	aca	ttc	cag	gtg	3049
Phe	Thr	Asp	Asn	Ser	Ser	Pro	Pro	Ala	Val	Pro	Gln	Thr	Phe	Gln	Val	
			405					410					415			
gcc	cat	cta	cac	gcc	cct	act	ggg	agc	ggc	aag	agc	act	aag	gtg	ccg	3097
Ala	His	Leu	His	Ala	Pro	Thr	Gly	Ser	Gly	Lys	Ser	Thr	Lys	Val	Pro	
			420					425					430			
gct	gcg	tat	gca	gcc	caa	ggg	tat	aag	gtg	ctt	gtc	ctg	aac	ccg	tcc	3145
Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr	Lys	Val	Leu	Val	Leu	Asn	Pro	Ser	
		435					440					445				
gtc	gcc	gcc	acc	cta	ggg	ttc	ggg	gcg	tat	atg	tct	aag	gca	cat	ggg	3193
Val	Ala	Ala	Thr	Leu	Gly	Phe	Gly	Ala	Tyr	Met	Ser	Lys	Ala	His	Gly	
	450					455					460					
atc	gac	cct	aac	atc	aga	acc	ggg	gta	agg	acc	atc	acc	acg	ggg	gcc	3241
Ile	Asp	Pro	Asn	Ile	Arg	Thr	Gly	Val	Arg	Thr	Ile	Thr	Thr	Gly	Ala	
465					470					475					480	

ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc	3289
Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys	
485 490 495	
tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act	3337
Ser Gly Gly Ala Tyr Asp Ile Ile Cys Asp Glu Cys His Ser Thr	
500 505 510	
gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag	3385
Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu	
515 520 525	
acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga	3433
Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly	
530 535 540	
tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc	3481
Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser	
545 550 555 560	
act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc	3529
Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile	
565 570 575	
aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgc gat	3577
Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp	
580 585 590	
gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca tat	3625
Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr	
595 600 605	
tac cgg ggc ctt gat gta tcc gtc ata cca act agc gga gac gtc att	3673
Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile	
610 615 620	
gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac	3721
Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp	
625 630 635 640	
tca gtg atc gac tgc aat aca tgt gtc acc cag aca gtc gac ttc agc	3769
Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser	
645 650 655	
ctg gac ccg acc ttc acc att gag acg acg acc gtg cca caa gac gcg	3817
Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Thr Val Pro Gln Asp Ala	
660 665 670	
gtg tca cgc tcg cag cgg cga ggc agg act ggt agg ggc agg atg ggc	3865
Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met Gly	
675 680 685	
att tac agg ttt gtg act cca gga gaa cgg ccc tcg ggc atg ttc gat	3913
Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp	

690	695	700	
tcc tgc gtt ctg tgc gag tgc tat gac gcg ggc tgt gct tgg tac gag Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu 705 710 715 720			3961
ctc acg ccc gcc gag acc tca gtt agg ttg cgg gct tac cta aac aca Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr 725 730 735			4009
cca ggg ttg ccc gtc tgc cag gac cat ctg gag ttc tgg gag ggc gtc Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly Val 740 745 750			4057
ttt aca ggc ctc acc cac ata gac gcc cat ttc ttg tcc cag act aag Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys 755 760 765			4105
cag gca gga gac aac ttc ccc tac ctg gta gca tac cag gct acg gtg Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val 770 775 780			4153
tgc gcc agg gct cag gct cca cct cca tcg tgg gac caa atg tgg aag Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp Lys 785 790 795 800			4201
tgt ctc ata cgg cta aag cct acg ctg cac ggg cca acg ccc ctg ctg Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu 805 810 815			4249
tat agg ctg gga gcc gtt caa aac gag gtt act acc aca cac ccc ata Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr Thr His Pro Ile 820 825 830			4297
acc aaa tac atc atg gca tgc atg tcg gct gac ctg gag gtc gtc acg Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val Thr 835 840 845			4345
agc acc tgg gtg ctg gta ggc gga gtc cta gca gct ctg gct gcg tat Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr 850 855 860			4393
tgc ctg aca aca ggc agc gtg gtc att gtg ggc agg atc atc ttg tcc Cys Leu Thr Thr Gly Ser Val Val Ile Val Gly Arg Ile Ile Leu Ser 865 870 875 880			4441
gga agg ccg gcc atc att ccc gac agg gaa gtc ctt tac cgg gag ttc Gly Arg Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu Phe 885 890 895			4489
gat gag atg gaa gag tgt gcc tca cac ctc cct tac atc gaa cag gga Asp Glu Met Glu Glu Cys Ala Ser His Leu Pro Tyr Ile Glu Gln Gly 900 905 910			4537
atg cag ctc gcc gaa caa ttc aaa cag aag gca atc ggg ttg ctg caa			4585

Met	Gln	Leu	Ala	Glu	Gln	Phe	Lys	Gln	Lys	Ala	Ile	Gly	Leu	Leu	Gln	
		915					920					925				
aca	gcc	acc	aag	caa	gcg	gag	gct	gct	gct	ccc	gtg	gtg	gaa	tcc	aag	4633
Thr	Ala	Thr	Lys	Gln	Ala	Glu	Ala	Ala	Ala	Pro	Val	Val	Glu	Ser	Lys	
		930				935					940					
tgg	cgg	acc	ctc	gaa	gcc	ttc	tgg	gcg	aag	cat	atg	tgg	aat	ttc	atc	4681
Trp	Arg	Thr	Leu	Glu	Ala	Phe	Trp	Ala	Lys	His	Met	Trp	Asn	Phe	Ile	
		945			950					955					960	
agc	ggg	ata	caa	tat	tta	gca	ggc	ttg	tcc	act	ctg	cct	ggc	aac	ccc	4729
Ser	Gly	Ile	Gln	Tyr	Leu	Ala	Gly	Leu	Ser	Thr	Leu	Pro	Gly	Asn	Pro	
				965					970					975		
gcg	ata	gca	tca	ctg	atg	gca	ttc	aca	gcc	tct	atc	acc	agc	ccg	ctc	4777
Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala	Ser	Ile	Thr	Ser	Pro	Leu	
			980					985					990			
acc	acc	caa	cat	acc	ctc	ctg	ttt	aac	atc	ctg	ggg	gga	tgg	gtg	gcc	4825
Thr	Thr	Gln	His	Thr	Leu	Leu	Phe	Asn	Ile	Leu	Gly	Gly	Trp	Val	Ala	
		995					1000					1005				
gcc	caa	ctt	gct	cct	ccc	agc	gct	gct	tcc	gct	ttc	gta	ggc	gcc	ggc	4873
Ala	Gln	Leu	Ala	Pro	Pro	Ser	Ala	Ala	Ser	Ala	Phe	Val	Gly	Ala	Gly	
		1010				1015					1020					
atc	gct	gga	gcg	gct	gtt	ggc	agc	ata	ggc	ctt	ggg	aag	gtg	ctt	gtg	4921
Ile	Ala	Gly	Ala	Ala	Val	Gly	Ser	Ile	Gly	Leu	Gly	Lys	Val	Leu	Val	
		1025			1030					1035					1040	
gat	att	ttg	gca	ggg	tat	gga	gca	ggg	gtg	gca	ggc	gcg	ctc	gtg	gcc	4969
Asp	Ile	Leu	Ala	Gly	Tyr	Gly	Ala	Gly	Val	Ala	Gly	Ala	Leu	Val	Ala	
				1045					1050					1055		
ttt	aag	gtc	atg	agc	ggc	gag	atg	ccc	tcc	acc	gag	gac	ctg	gtt	aac	5017
Phe	Lys	Val	Met	Ser	Gly	Glu	Met	Pro	Ser	Thr	Glu	Asp	Leu	Val	Asn	
			1060					1065					1070			
cta	ctc	cct	gct	atc	ctc	tcc	cct	ggc	gcc	cta	gtc	gtc	ggg	gtc	gtg	5065
Leu	Leu	Pro	Ala	Ile	Leu	Ser	Pro	Gly	Ala	Leu	Val	Val	Gly	Val	Val	
		1075					1080					1085				
tgc	gca	gcg	ata	ctg	cgt	cgg	cac	gtg	ggc	cca	ggg	gag	ggg	gct	gtg	5113
Cys	Ala	Ala	Ile	Leu	Arg	Arg	His	Val	Gly	Pro	Gly	Glu	Gly	Ala	Val	
		1090				1095					1100					
cag	tgg	atg	aac	cgg	ctg	ata	gcg	ttc	gct	tcg	cgg	ggg	aac	cac	gtc	5161
Gln	Trp	Met	Asn	Arg	Leu	Ile	Ala	Phe	Ala	Ser	Arg	Gly	Asn	His	Val	
		1105			1110					1115					1120	
tcc	ccc	acg	cac	tat	gtg	cct	gag	agc	gac	gct	gca	gca	cgt	gtc	act	5209
Ser	Pro	Thr	His	Tyr	Val	Pro	Glu	Ser	Asp	Ala	Ala	Ala	Arg	Val	Thr	
				1125					1130					1135		

cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac	5257
Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His	
1140 1145 1150	
cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta	5305
Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu	
1155 1160 1165	
aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag gcc	5353
Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Ala	
1170 1175 1180	
tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc	5401
Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe	
1185 1190 1195 1200	
tca tgt caa cgt ggg tac aag gga gtc tgg cgg ggc gac ggc atc atg	5449
Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met	
1205 1210 1215	
caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac	5497
Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn	
1220 1225 1230	
tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat	5545
Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His	
1235 1240 1245	
gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc	5593
Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser	
1250 1255 1260	
ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag	5641
Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu	
1265 1270 1275 1280	
tac gtg gag gtt acg cga gtg ggg gat ttc cac tac gtg acg ggc atg	5689
Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met	
1285 1290 1295	
acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc	5737
Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe	
1300 1305 1310	
ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc	5785
Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys	
1315 1320 1325	
aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa	5833
Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln	
1330 1335 1340	
tac ccg gtt ggg tca cag ctc cca tgc gag ccc gaa ctg gac gta gca	5881
Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Leu Asp Val Ala	
1345 1350 1355 1360	

gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg	5929
Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr	
1365 1370 1375	
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca	5977
Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser	
1380 1385 1390	
tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc	6025
Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr	
1395 1400 1405	
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg	6073
Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp	
1410 1415 1420	
cgg cag gag atg ggc ggg aac atc acc cgc gtg gag tca gag aat aag	6121
Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys	
1425 1430 1435 1440	
gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag	6169
Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu	
1445 1450 1455	
agg gaa gta tcc gtt ccg gcg gag atc ctg cgg agg tcc agg aaa ttc	6217
Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe	
1460 1465 1470	
cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg	6265
Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu	
1475 1480 1485	
tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg	6313
Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly	
1490 1495 1500	
tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca cgg agg	6361
Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg	
1505 1510 1515 1520	
aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg	6409
Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala	
1525 1530 1535	
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac	6457
Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp	
1540 1545 1550	
agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac	6505
Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp	
1555 1560 1565	
gcg gga tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag ggg	6553
Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly	

1570	1575	1580	
gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc			6601
Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser			
1585	1590	1595	1600
gag gag gct agt gag gac gtc gtc tgc tgc tcg atg tcc tac aca tgg			6649
Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp			
	1605	1610	1615
aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc			6697
Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro			
	1620	1625	1630
atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat			6745
Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr			
	1635	1640	1645
gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt			6793
Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe			
	1650	1655	1660
gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag			6841
Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu			
	1665	1670	1675
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag			6889
Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu			
	1685	1690	1695
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc			6937
Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly			
	1700	1705	1710
tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac			6985
Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His			
	1715	1720	1725
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att			7033
Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile			
	1730	1735	1740
gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag			7081
Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu			
	1745	1750	1755
aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg			7129
Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly			
	1765	1770	1775
gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc			7177
Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu			
	1780	1785	1790
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga			7225

Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly	
1795	1800
1805	
cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct	7273
Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro	
1810	1815
1820	
atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag	7321
Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu	
1825	1830
1835	1840
aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc	7369
Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala	
1845	1850
1855	
ccc gaa gcc aga cag gcc ata agg tgc ctc aca gag cgg ctt tac atc	7417
Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile	
1860	1865
1870	
ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg	7465
Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg	
1875	1880
1885	
tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca	7513
Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr	
1890	1895
1900	
tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac	7561
Cys Tyr Leu Lys Ala Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp	
1905	1910
1915	1920
tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc	7609
Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser	
1925	1930
1935	
gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct	7657
Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala	
1940	1945
1950	
atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa tac	7705
Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr	
1955	1960
1965	
gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac	7753
Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His	
1970	1975
1980	
gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc	7801
Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr	
1985	1990
1995	2000
ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc aat	7849
Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn	
2005	2010
2015	

tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg	7897
Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg	
2020 2025 2030	
atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa	7945
Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln	
2035 2040 2045	
ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att	7993
Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile	
2050 2055 2060	
gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc	8041
Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser	
2065 2070 2075 2080	
gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct	8089
Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala	
2085 2090 2095	
tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat	8137
Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His	
2100 2105 2110	
cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct	8185
Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala	
2115 2120 2125	
gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc	8233
Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu	
2130 2135 2140	
aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg	8281
Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp	
2145 2150 2155 2160	
ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt	8329
Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg	
2165 2170 2175	
gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg	8377
Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val Gly	
2180 2185 2190	
gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca	8427
Val Gly Ile Tyr Leu Leu Pro Asn Arg *	
2195 2200	
ggccaatagg ccatactgtt tttttccctt tttttttttt tttttttttt tttttttttt	8487
tttttttttt ttttttcctt tttttttcct ctttttttcc ttttttttcc ttttggtggct	8547
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<212> DNA
 <213> HCV

 <400> 8
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 <210> 9
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 gac 63

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 <212> DNA
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 <400> 11
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 <220>
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 <223> Label with TAMRA: Quencher dye

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27

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<212> DNA

<213> HCV

<400> 22

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23

<210> 23

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<400> 23

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27

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<220>

<221> CDS

<222> (1802)... (8407)

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c atg gac	cgg gag atg	gca gca tcg	tgc gga ggc	gcg gtt ttc	gta ggt	1849
Met Asp Arg	Glu Met Ala	Ala Ala Ser	Cys Gly Gly	Ala Val Phe	Val Gly	
1	5	10	15			
ctg ata ctc	ttg acc ttg	tca ccg cac	tat aag ctg	ttc ctc gct	agg	1897
Leu Ile Leu	Leu Thr Leu	Ser Pro His	Tyr Lys Leu	Phe Leu Ala	Arg	
20	25	30				
ctc ata tgg	tgg tta caa	tat ttt atc	acc agg gcc	gag gca cac	ttg	1945
Leu Ile Trp	Trp Leu Gln	Tyr Phe Ile	Thr Arg Ala	Glu Ala His	Leu	
35	40	45				
caa gtg tgg	atc ccc ccc	ctc aac gtt	cgg ggg ggc	cgc gat gcc	gtc	1993
Gln Val Trp	Ile Pro Pro	Leu Asn Val	Arg Gly Gly	Arg Asp Ala	Val	
50	55	60				
atc ctc ctc	acg tgc gcg	atc cac cca	gag cta atc	ttt acc atc	acc	2041
Ile Leu Leu	Thr Cys Ala	Ile His Pro	Glu Leu Ile	Phe Thr Ile	Thr	
65	70	75	80			
aaa atc ttg	ctc gcc ata	ctc ggt cca	ctc atg gtg	ctc cag gct	ggt	2089
Lys Ile Leu	Leu Ala Ile	Leu Gly Pro	Leu Met Val	Leu Gln Ala	Gly	
85	90	95				
ata acc aaa	gtg ccg tac	ttc gtg cgc	gca cac ggg	ctc att cgt	gca	2137
Ile Thr Lys	Val Pro Tyr	Phe Val Arg	Ala His Gly	Leu Ile Arg	Ala	
100	105	110				
tgc atg ctg	gtg cgg aag	gtt gct ggg	ggt cat tat	gtc caa atg	gct	2185
Cys Met Leu	Val Arg Lys	Val Ala Gly	Gly Gly His	Tyr Val Gln	Met Ala	
115	120	125				
ctc atg aag	ttg gcc gca	ctg aca ggt	acg tac gtt	tat gac cat	ctc	2233
Leu Met Lys	Leu Ala Ala	Leu Thr Gly	Thr Tyr Val	Tyr Asp His	Leu	
130	135	140				
acc cca ctg	cgg gac tgg	gcc cac gcg	ggc cta cga	gac ctt gcg	gtg	2281
Thr Pro Leu	Arg Asp Trp	Ala His Ala	Gly Leu Arg	Asp Leu Ala	Val	
145	150	155	160			
gca gtt gag	ccc gtc gtc	ttc tct gat	atg gag acc	aag gtt atc	acc	2329
Ala Val Glu	Pro Val Val	Phe Ser Asp	Met Glu Thr	Lys Val Ile	Thr	
165	170	175				
tgg ggg gca	gac acc gcg	gcg tgt ggg	gac atc atc	ttg ggc ctg	ccc	2377
Trp Gly Ala	Asp Thr Ala	Ala Cys Gly	Asp Ile Ile	Leu Gly Leu	Pro	
180	185	190				

gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc	2425
Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser	
195 200 205	
ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc	2473
Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser	
210 215 220	
caa cag acg cga ggc cta ctt ggc tgc atc atc act agc ctc aca ggc	2521
Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly	
225 230 235 240	
cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca	2569
Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala	
245 250 255	
aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc	2617
Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val	
260 265 270	
tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc	2665
Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile	
275 280 285	
acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg	2713
Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala	
290 295 300	
ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac	2761
Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp	
305 310 315 320	
ctt tac ttg gtc acg agg cat gcc gat gtc att ccg gtg cgc cgg cgg	2809
Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg	
325 330 335	
ggc gac agc agg ggg agc cta ctc tcc ccc agg ccc gtc tcc tac ttg	2857
Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu	
340 345 350	
aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg	2905
Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val	
355 360 365	
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Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val	
370 375 380	
gac ttt gta ccc gtc gag tct atg gaa acc act atg cgg tcc ccg gtc	3001
Asp Phe Val Pro Val Glu Ser Met Glu Thr Thr Met Arg Ser Pro Val	
385 390 395 400	
ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag gtg	3049
Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val	
405 410 415	

gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag.gtg ccg	3097
Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro	
420 425 430	
gct gcg tat gca gcc caa ggg tat aag gtg ctt gtc ctg aac ccg tcc	3145
Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser	
435 440 445	
gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt	3193
Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly	
450 455 460	
atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt gcc	3241
Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala	
465 470 475 480	
ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc	3289
Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys	
485 490 495	
tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act	3337
Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr	
500 505 510	
gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag	3385
Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu	
515 520 525	
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Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly	
530 535 540	
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Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser	
545 550 555 560	
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Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile	
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Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp	
580 585 590	
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Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr	
595 600 605	
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Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile	
610 615 620	
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Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp	

625						630						635						640	
tca	gtg	atc	gac	tgc	aat	aca	tgt	gtc	acc	cag	aca	gtc	gac	ttc	agc		3769		
Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys	Val	Thr	Gln	Thr	Val	Asp	Phe	Ser				
				645					650					655					
ctg	gac	ccg	acc	ttc	acc	att	gag	acg	acc	gtg	cca	caa	gac	gcg		3817			
Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu	Thr	Thr	Thr	Val	Pro	Gln	Asp	Ala				
			660					665					670						
gtg	tca	cgc	tcg	cag	cgg	cga	ggc	agg	act	ggg	agg	ggc	agg	atg	ggc		3865		
Val	Ser	Arg	Ser	Gln	Arg	Arg	Gly	Arg	Thr	Gly	Arg	Gly	Arg	Met	Gly				
		675					680					685							
att	tac	agg	ttt	gtg	act	cca	gga	gaa	cgg	ccc	tcg	ggc	atg	ttc	gat		3913		
Ile	Tyr	Arg	Phe	Val	Thr	Pro	Gly	Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp				
	690					695					700								
tcc	tcg	gtt	ctg	tgc	gag	tgc	tat	gac	gcg	ggc	tgt	gct	tggt	tac	gag		3961		
Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu				
705					710					715					720				
ctc	acg	ccc	gcc	gag	acc	tca	gtt	agg	ttg	cgg	gct	tac	cta	aac	aca		4009		
Leu	Thr	Pro	Ala	Glu	Thr	Ser	Val	Arg	Leu	Arg	Ala	Tyr	Leu	Asn	Thr				
				725					730					735					
cca	ggg	ttg	ccc	gtc	tgc	cag	gac	cat	ctg	gag	ttc	tggt	gag	agc	gtc		4057		
Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp	His	Leu	Glu	Phe	Trp	Glu	Ser	Val				
			740					745					750						
ttt	aca	ggc	ctc	acc	cac	ata	gac	gcc	cat	ttc	ttg	tcc	cag	act	aag		4105		
Phe	Thr	Gly	Leu	Thr	His	Ile	Asp	Ala	His	Phe	Leu	Ser	Gln	Thr	Lys				
		755					760					765							
cag	gca	gga	gac	aac	ttc	ccc	tac	ctg	gta	gca	tac	cag	gct	acg	gtg		4153		
Gln	Ala	Gly	Asp	Asn	Phe	Pro	Tyr	Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val				
	770					775					780								
tgc	gcc	agg	gct	cag	gct	cca	cct	cca	tcg	tggt	gac	caa	atg	tggt	aag		4201		
Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	Pro	Ser	Trp	Asp	Gln	Met	Trp	Lys				
785					790					795				800					
tgt	ctc	ata	cgg	cta	aag	cct	acg	ctg	cac	ggg	cca	acg	ccc	ctg	ctg		4249		
Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr	Leu	His	Gly	Pro	Thr	Pro	Leu	Leu				
				805					810					815					
tat	agg	ctg	gga	gcc	gtt	caa	aac	gag	gtt	act	acc	aca	cac	ccc	ata		4297		
Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn	Glu	Val	Thr	Thr	Thr	His	Pro	Ile				
			820					825					830						
acc	aaa	tac	atc	atg	gca	tgc	atg	tcg	gct	gac	ctg	gag	gtc	gtc	acg		4345		
Thr	Lys	Tyr	Ile	Met	Ala	Cys	Met	Ser	Ala	Asp	Leu	Glu	Val	Val	Thr				
		835					840					845							
agc	acc	tggt	gtg	ctg	gta	ggc	gga	gtc	cta	gca	gct	ctg	gcc	gcg	tat		4393		

Ser	Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr	
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tgc	ctg	aca	aca	ggc	agc	gtg	gtc	att	gtg	ggc	agg	atc	atc	ttg	tcc	4441
Cys	Leu	Thr	Thr	Gly	Ser	Val	Val	Ile	Val	Gly	Arg	Ile	Ile	Leu	Ser	
865					870					875					880	
gga	aag	ccg	gcc	atc	att	ccc	gac	agg	gaa	gtc	ctt	tac	cgg	gag	ttc	4489
Gly	Lys	Pro	Ala	Ile	Ile	Pro	Asp	Arg	Glu	Val	Leu	Tyr	Arg	Glu	Phe	
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gat	gag	atg	gaa	gag	tgc	gcc	tca	cac	ctc	cct	tac	atc	gaa	cag	gga	4537
Asp	Glu	Met	Glu	Glu	Cys	Ala	Ser	His	Leu	Pro	Tyr	Ile	Glu	Gln	Gly	
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Met	Gln	Leu	Ala	Glu	Gln	Phe	Lys	Gln	Lys	Ala	Ile	Gly	Leu	Leu	Gln	
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Thr	Ala	Thr	Lys	Gln	Ala	Glu	Ala	Ala	Ala	Pro	Val	Val	Glu	Ser	Lys	
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tgg	cgg	acc	ctc	gaa	gcc	ttc	tgg	gcg	aag	cat	atg	tgg	aat	ttc	atc	4681
Trp	Arg	Thr	Leu	Glu	Ala	Phe	Trp	Ala	Lys	His	Met	Trp	Asn	Phe	Ile	
945					950					955					960	
agc	ggg	ata	caa	tat	tta	gca	ggc	ttg	tcc	act	ctg	cct	ggc	aac	ccc	4729
Ser	Gly	Ile	Gln	Tyr	Leu	Ala	Gly	Leu	Ser	Thr	Leu	Pro	Gly	Asn	Pro	
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gcg	ata	gca	tca	ctg	atg	gca	ttc	aca	gcc	tct	atc	acc	agc	ccg	ctc	4777
Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala	Ser	Ile	Thr	Ser	Pro	Leu	
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acc	acc	caa	cat	acc	ctc	ctg	ttt	aac	atc	ctg	ggg	gga	tgg	gtg	gcc	4825
Thr	Thr	Gln	His	Thr	Leu	Leu	Phe	Asn	Ile	Leu	Gly	Gly	Trp	Val	Ala	
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gcc	caa	ctt	gct	cct	ccc	agc	gct	gct	tct	gct	ttc	gta	ggc	gcc	ggc	4873
Ala	Gln	Leu	Ala	Pro	Pro	Ser	Ala	Ala	Ser	Ala	Phe	Val	Gly	Ala	Gly	
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Ile	Ala	Gly	Ala	Ala	Val	Gly	Ser	Ile	Gly	Leu	Gly	Lys	Val	Leu	Val	
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gat	att	ttg	gca	ggt	tat	gga	gca	ggg	gtg	gca	ggc	gcg	ctc	gtg	gcc	4969
Asp	Ile	Leu	Ala	Gly	Tyr	Gly	Ala	Gly	Val	Ala	Gly	Ala	Leu	Val	Ala	
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ttt	aag	gtc	atg	agc	ggc	gag	atg	ccc	tcc	acc	gag	gac	ctg	gtt	aac	5017
Phe	Lys	Val	Met	Ser	Gly	Glu	Met	Pro	Ser	Thr	Glu	Asp	Leu	Val	Asn	
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Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val	
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Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val	
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Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val	
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Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr	
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Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His	
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Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu	
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aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag acc	5353
Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Thr	
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Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe	
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Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met	
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Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn	
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Gly Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His	
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Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser	
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Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu	
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Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met	
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acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc	5737
Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe	
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Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys	
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Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln	
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Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala	
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Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp	
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Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys	
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Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu	
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Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu	
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Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly	
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Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg	

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Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala	1525	1530	1535	
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Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp	1540	1545	1550	
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Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp	1555	1560	1565	
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Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly	1570	1575	1580	
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Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser	1585	1590	1595	1600
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Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp	1605	1610	1615	
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Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro	1620	1625	1630	
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Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr	1635	1640	1645	
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Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe	1650	1655	1660	
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Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu	1665	1670	1675	1680
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Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu	1685	1690	1695	
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Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly	1700	1705	1710	
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Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His	1715	1720	1725	
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Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile	
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Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly	
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Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu	
	1780 1785 1790
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga	7225
Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly	
	1795 1800 1805
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Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro	
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atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag	7321
Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu	
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Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala	
	1845 1850 1855
ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc	7417
Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile	
	1860 1865 1870
ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg	7465
Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg	
	1875 1880 1885
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Cys Arg Ala Ser Gly Val Leu Thr Ser Cys Gly Asn Thr Leu Thr	
	1890 1895 1900
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Cys Tyr Leu Lys Ala Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp	
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Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser	
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Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg	
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Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln	
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Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile	
2050 2055 2060	
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Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser	
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Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala	
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Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His	
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Arg Ala Arg Ser Val Arg Ala Arg Leu Ser Gln Gly Gly Arg Ala	
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Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp	
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Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg	
2165 2170 2175	

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 Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val Gly
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 Val Gly Ile Tyr Leu Leu Pro Asn Arg *
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Leu	Ile	Leu	Leu	Thr	Leu	Ser	Pro	His	Tyr	Lys	Leu	Phe	Leu	Ala	Arg	
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Leu	Ile	Trp	Trp	Leu	Gln	Tyr	Phe	Ile	Thr	Arg	Ala	Glu	Ala	His	Leu	
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Gln	Val	Trp	Ile	Pro	Pro	Leu	Asn	Val	Arg	Gly	Gly	Arg	Asp	Ala	Val	
	50					55					60					
atc	ctc	ctc	acg	tgc	gcg	atc	cac	cca	gag	cta	atc	ttt	acc	atc	acc	2041
Ile	Leu	Leu	Thr	Cys	Ala	Ile	His	Pro	Glu	Leu	Ile	Phe	Thr	Ile	Thr	
	65				70					75					80	
aaa	atc	ttg	ctc	goc	ata	ctc	ggt	cca	ctc	atg	gtg	ctc	cag	gct	ggt	2089
Lys	Ile	Leu	Leu	Ala	Ile	Leu	Gly	Pro	Leu	Met	Val	Leu	Gln	Ala	Gly	
				85				90						95		
ata	acc	aaa	gtg	ccg	tac	ttc	gtg	cgc	gca	cac	ggg	ctc	att	cgt	gca	2137
Ile	Thr	Lys	Val	Pro	Tyr	Phe	Val	Arg	Ala	His	Gly	Leu	Ile	Arg	Ala	
			100					105					110			
tgc	atg	ctg	gtg	cgg	aag	gtt	gct	ggg	ggt	cat	tat	gtc	caa	atg	gct	2185
Cys	Met	Leu	Val	Arg	Lys	Val	Ala	Gly	Gly	His	Tyr	Val	Gln	Met	Ala	
		115					120					125				
ctc	atg	aag	ttg	gcc	gca	ctg	aca	ggt	acg	tac	gtt	tat	gac	cat	ctc	2233
Leu	Met	Lys	Leu	Ala	Ala	Leu	Thr	Gly	Thr	Tyr	Val	Tyr	Asp	His	Leu	
	130					135					140					
acc	cca	ctg	cgg	gac	tgg	gcc	cac	gcg	ggc	cta	cga	gac	ctt	gcg	gtg	2281
Thr	Pro	Leu	Arg	Asp	Trp	Ala	His	Ala	Gly	Leu	Arg	Asp	Leu	Ala	Val	
	145			150					155						160	
gca	gtt	gag	ccc	gtc	gtc	ttc	tct	gat	atg	gag	acc	aag	gtt	atc	acc	2329
Ala	Val	Glu	Pro	Val	Val	Phe	Ser	Asp	Met	Glu	Thr	Lys	Val	Ile	Thr	
			165					170						175		
tgg	ggg	gca	gac	acc	gcg	gcg	tgt	ggg	gac	atc	atc	ttg	ggc	ctg	ccc	2377
Trp	Gly	Ala	Asp	Thr	Ala	Ala	Cys	Gly	Asp	Ile	Ile	Leu	Gly	Leu	Pro	
			180					185					190			
gtc	tcc	gcc	cgc	agg	ggg	agg	gag	ata	cat	ctg	gga	ccg	gca	gac	agc	2425
Val	Ser	Ala	Arg	Arg	Gly	Arg	Glu	Ile	His	Leu	Gly	Pro	Ala	Asp	Ser	
		195					200					205				
ctt	gaa	ggg	cag	ggg	tgg	cga	ctc	ctc	gcg	cct	att	acg	gcc	tac	tcc	2473
Leu	Glu	Gly	Gln	Gly	Trp	Arg	Leu	Leu	Ala	Pro	Ile	Thr	Ala	Tyr	Ser	
	210					215					220					

caa	cag	acg	cga	ggc	cta	ctt	ggc	tgc	atc	atc	acc	agc	ctc	aca	ggc	2521
Gln	Gln	Thr	Arg	Gly	Leu	Leu	Gly	Cys	Ile	Ile	Thr	Ser	Leu	Thr	Gly	
225					230				235						240	
cgg	gac	agg	aac	cag	gtc	gag	ggg	gag	gtc	caa	gtg	gtc	tcc	acc	gca	2569
Arg	Asp	Arg	Asn	Gln	Val	Glu	Gly	Glu	Val	Gln	Val	Val	Ser	Thr	Ala	
				245					250						255	
aca	caa	tct	ttc	ctg	gcg	acc	tgc	gtc	aat	ggc	gtg	tgt	tgg	act	gtc	2617
Thr	Gln	Ser	Phe	Leu	Ala	Thr	Cys	Val	Asn	Gly	Val	Cys	Trp	Thr	Val	
			260					265					270			
tat	cat	ggg	gcc	ggc	tca	aag	acc	ctt	gcc	ggc	cca	aag	ggc	cca	atc	2665
Tyr	His	Gly	Ala	Gly	Ser	Lys	Thr	Leu	Ala	Gly	Pro	Lys	Gly	Pro	Ile	
		275					280					285				
acc	caa	atg	tac	acc	aat	gtg	gac	cag	gac	ctc	gtc	ggc	tgg	caa	gcg	2713
Thr	Gln	Met	Tyr	Thr	Asn	Val	Asp	Gln	Asp	Leu	Val	Gly	Trp	Gln	Ala	
	290					295					300					
ccc	ccc	ggg	gcg	cgt	tcc	ttg	aca	cca	tgc	acc	tgc	ggc	agc	tcg	gac	2761
Pro	Pro	Gly	Ala	Arg	Ser	Leu	Thr	Pro	Cys	Thr	Cys	Gly	Ser	Ser	Asp	
305					310					315					320	
ctt	tac	ttg	gtc	acg	aag	cat	gcc	gat	gtc	att	ccg	gtg	cgc	cgg	cgg	2809
Leu	Tyr	Leu	Val	Thr	Lys	His	Ala	Asp	Val	Ile	Pro	Val	Arg	Arg	Arg	
				325					330					335		
ggc	gac	agc	agg	ggg	agc	cta	ctc	tcc	ccc	cgg	ccc	gtc	tcc	tac	ttg	2857
Gly	Asp	Ser	Arg	Gly	Ser	Leu	Leu	Ser	Pro	Arg	Pro	Val	Ser	Tyr	Leu	
			340					345					350			
aag	ggc	tct	tcg	ggc	ggt	cca	ctg	ctc	tgc	ccc	tcg	ggg	cac	gct	gtg	2905
Lys	Gly	Ser	Ser	Gly	Gly	Pro	Leu	Leu	Cys	Pro	Ser	Gly	His	Ala	Val	
		355					360					365				
ggc	atc	ttt	cgg	gct	gcc	gtg	tgc	acc	cga	ggg	gtt	gcg	aag	gcg	gtg	2953
Gly	Ile	Phe	Arg	Ala	Ala	Val	Cys	Thr	Arg	Gly	Val	Ala	Lys	Ala	Val	
	370					375					380					
gac	ttt	gta	ccc	gtc	gag	tct	atg	gaa	acc	act	atg	cgg	tcc	ccg	gtc	3001
Asp	Phe	Val	Pro	Val	Glu	Ser	Met	Glu	Thr	Thr	Met	Arg	Ser	Pro	Val	
385					390					395					400	
ttc	acg	gac	aac	tcg	tcc	cct	ccg	gcc	gta	ccg	cag	aca	ttc	cag	gtg	3049
Phe	Thr	Asp	Asn	Ser	Ser	Pro	Pro	Ala	Val	Pro	Gln	Thr	Phe	Gln	Val	
				405					410					415		
gcc	cat	cta	cac	gcc	cct	act	ggt	agc	ggc	aag	agc	act	aag	gtg	ccg	3097
Ala	His	Leu	His	Ala	Pro	Thr	Gly	Ser	Gly	Lys	Ser	Thr	Lys	Val	Pro	
			420					425					430			
gct	gcg	tat	gca	gcc	caa	ggg	tat	aag	gtg	ctt	gtc	ctg	aac	ccg	tcc	3145
Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr	Lys	Val	Leu	Val	Leu	Asn	Pro	Ser	
		435					440					445				

gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt	3193
Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly	
450 455 460	
atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt gcc	3241
Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala	
465 470 475 480	
ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc	3289
Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys	
485 490 495	
tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act	3337
Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr	
500 505 510	
gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag	3385
Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu	
515 520 525	
acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga	3433
Thr Ala Gly Ala Arg Leu Val Leu Ala Thr Ala Thr Pro Pro Gly	
530 535 540	
tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc	3481
Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser	
545 550 555 560	
act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc	3529
Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile	
565 570 575	
aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgc gat	3577
Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp	
580 585 590	
gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca tat	3625
Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr	
595 600 605	
tac cgg ggc ctt gat gta tcc gtc ata cca act agc gga gac gtc att	3673
Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile	
610 615 620	
gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac	3721
Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp	
625 630 635 640	
tca gtg atc gac tgc aat aca tgt gtc acc cag aca gtc gac ttc agc	3769
Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser	
645 650 655	
ctg gac ccg acc ttc acc att gag acg acg acc gtg cca caa gac gcg	3817
Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Thr Val Pro Gln Asp Ala	

660										665					670					
gtg	tca	cgc	tcg	cag	cgg	cga	ggc	agg	act	ggg	agg	ggc	agg	atg	ggc	3865				
Val	Ser	Arg	Ser	Gln	Arg	Arg	Gly	Arg	Thr	Gly	Arg	Gly	Arg	Met	Gly					
		675					680					685								
att	tac	agg	ttt	gtg	act	cca	gga	gaa	cgg	ccc	tcg	ggc	atg	ttc	gat	3913				
Ile	Tyr	Arg	Phe	Val	Thr	Pro	Gly	Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp					
	690					695				700										
tcc	tcg	gtt	ctg	tgc	gag	tgc	tat	gac	gcg	ggc	tgt	gct	tgg	tac	gag	3961				
Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu					
705				710						715					720					
ctc	acg	ccc	gcc	gag	acc	tca	gtt	agg	ttg	cgg	gct	tac	cta	aac	aca	4009				
Leu	Thr	Pro	Ala	Glu	Thr	Ser	Val	Arg	Leu	Arg	Ala	Tyr	Leu	Asn	Thr					
				725					730					735						
cca	ggg	ttg	ccc	gtc	tgc	cag	gac	cat	ctg	gag	ttc	tgg	gag	ggc	gtc	4057				
Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp	His	Leu	Glu	Phe	Trp	Glu	Gly	Val					
			740					745					750							
ttt	aca	ggc	ctc	acc	cac	ata	gac	gcc	cat	ttc	ttg	tcc	cag	act	aag	4105				
Phe	Thr	Gly	Leu	Thr	His	Ile	Asp	Ala	His	Phe	Leu	Ser	Gln	Thr	Lys					
		755					760					765								
cag	gca	gga	gac	aac	ttc	ccc	tac	ctg	gta	gca	tac	cag	gct	acg	gtg	4153				
Gln	Ala	Gly	Asp	Asn	Phe	Pro	Tyr	Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val					
	770					775					780									
tgc	gcc	agg	gct	cag	gct	cca	cct	cca	tcg	tgg	gac	caa	atg	tgg	aag	4201				
Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	Pro	Ser	Trp	Asp	Gln	Met	Trp	Lys					
785				790						795					800					
tgt	ctc	ata	cgg	cta	aag	cct	acg	ctg	cac	ggg	cca	acg	ccc	ctg	ctg	4249				
Cys	Leu	Ile	Arg	Leu	Lys	Pro	Thr	Leu	His	Gly	Pro	Thr	Pro	Leu	Leu					
				805					810					815						
tat	agg	ctg	gga	gcc	gtt	caa	aac	gag	gtt	act	acc	aca	cac	ccc	ata	4297				
Tyr	Arg	Leu	Gly	Ala	Val	Gln	Asn	Glu	Val	Thr	Thr	Thr	His	Pro	Ile					
			820					825					830							
acc	aaa	tac	atc	atg	gca	tgc	atg	tcg	gct	gac	ctg	gag	gtc	gtc	acg	4345				
Thr	Lys	Tyr	Ile	Met	Ala	Cys	Met	Ser	Ala	Asp	Leu	Glu	Val	Val	Thr					
		835					840					845								
agc	acc	tgg	gtg	ctg	gta	ggc	gga	gtc	cta	gca	gct	ctg	gct	gcg	tat	4393				
Ser	Thr	Trp	Val	Leu	Val	Gly	Gly	Val	Leu	Ala	Ala	Leu	Ala	Ala	Tyr					
		850				855					860									
tgc	ctg	aca	aca	ggc	agc	gtg	gtc	att	gtg	ggc	agg	atc	atc	ttg	tcc	4441				
Cys	Leu	Thr	Thr	Gly	Ser	Val	Val	Ile	Val	Gly	Arg	Ile	Ile	Leu	Ser					
865				870						875					880					
gga	agg	ccg	gcc	atc	att	ccc	gac	agg	gaa	gtc	ctt	tac	cgg	gag	ttc	4489				

Gly	Arg	Pro	Ala	Ile	Ile	Pro	Asp	Arg	Glu	Val	Leu	Tyr	Arg	Glu	Phe		
				885					890					895			
gat	gag	atg	gaa	gag	tgt	gcc	tca	cac	ctc	cct	tac	atc	gaa	cag	gga	4537	
Asp	Glu	Met	Glu	Glu	Cys	Ala	Ser	His	Leu	Pro	Tyr	Ile	Glu	Gln	Gly		
			900					905					910				
atg	cag	ctc	gcc	gaa	caa	ttc	aaa	cag	aag	gca	atc	ggg	ttg	ctg	caa	4585	
Met	Gln	Leu	Ala	Glu	Gln	Phe	Lys	Gln	Lys	Ala	Ile	Gly	Leu	Leu	Gln		
		915					920					925					
aca	gcc	acc	aag	caa	gcg	gag	gct	gct	gct	ccc	gtg	gtg	gaa	tcc	aag	4633	
Thr	Ala	Thr	Lys	Gln	Ala	Glu	Ala	Ala	Ala	Pro	Val	Val	Glu	Ser	Lys		
	930					935					940						
tgg	cgg	acc	ctc	gaa	gcc	ttc	tgg	gcg	aag	cat	atg	tgg	aat	ttc	atc	4681	
Trp	Arg	Thr	Leu	Glu	Ala	Phe	Trp	Ala	Lys	His	Met	Trp	Asn	Phe	Ile		
945				950					955					960			
agc	ggg	ata	caa	tat	tta	gca	ggc	ttg	tcc	act	ctg	cct	ggc	aac	ccc	4729	
Ser	Gly	Ile	Gln	Tyr	Leu	Ala	Gly	Leu	Ser	Thr	Leu	Pro	Gly	Asn	Pro		
			965					970					975				
gcg	ata	gca	tca	ctg	atg	gca	ttc	aca	gcc	tct	atc	acc	agc	ccg	ctc	4777	
Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala	Ser	Ile	Thr	Ser	Pro	Leu		
			980					985					990				
acc	acc	caa	cat	acc	ctc	ctg	ttt	aac	atc	ctg	ggg	gga	tgg	gtg	gcc	4825	
Thr	Thr	Gln	His	Thr	Leu	Leu	Phe	Asn	Ile	Leu	Gly	Gly	Trp	Val	Ala		
		995					1000					1005					
gcc	caa	ctt	gct	cct	ccc	agc	gct	gct	tcc	gct	ttc	gta	ggc	gcc	ggc	4873	
Ala	Gln	Leu	Ala	Pro	Pro	Ser	Ala	Ala	Ser	Ala	Phe	Val	Gly	Ala	Gly		
	1010					1015					1020						
atc	gct	gga	gcg	gct	gtt	ggc	agc	ata	ggc	ctt	ggg	aag	gtg	ctt	gtg	4921	
Ile	Ala	Gly	Ala	Ala	Val	Gly	Ser	Ile	Gly	Leu	Gly	Lys	Val	Leu	Val		
1025				1030					1035					1040			
gat	att	ttg	gca	ggt	tat	gga	gca	ggg	gtg	gca	ggc	gcg	ctc	gtg	gcc	4969	
Asp	Ile	Leu	Ala	Gly	Tyr	Gly	Ala	Gly	Val	Ala	Gly	Ala	Leu	Val	Ala		
			1045					1050					1055				
ttt	aag	gtc	atg	agc	ggc	gag	atg	ccc	tcc	acc	gag	gac	ctg	gtt	aac	5017	
Phe	Lys	Val	Met	Ser	Gly	Glu	Met	Pro	Ser	Thr	Glu	Asp	Leu	Val	Asn		
		1060						1065				1070					
cta	ctc	cct	gct	atc	ctc	tcc	cct	ggc	gcc	cta	gtc	gtc	ggg	gtc	gtg	5065	
Leu	Leu	Pro	Ala	Ile	Leu	Ser	Pro	Gly	Ala	Leu	Val	Val	Gly	Val	Val		
		1075					1080					1085					
tgc	gca	gcg	ata	ctg	cgt	cgg	cac	gtg	ggc	cca	ggg	gag	ggg	gct	gtg	5113	
Cys	Ala	Ala	Ile	Leu	Arg	Arg	His	Val	Gly	Pro	Gly	Glu	Gly	Ala	Val		
	1090					1095					1100						

cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc	5161
Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val	
1105 1110 1115 1120	
tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act	5209
Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr	
1125 1130 1135	
cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac	5257
Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His	
1140 1145 1150	
cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta	5305
Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu	
1155 1160 1165	
aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag gcc	5353
Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Ala	
1170 1175 1180	
tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc	5401
Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe	
1185 1190 1195 1200	
tca tgt caa cgt ggg tac aag gga gtc tgg cgg ggc gac ggc atc atg	5449
Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met	
1205 1210 1215	
caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac	5497
Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn	
1220 1225 1230	
tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat	5545
Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His	
1235 1240 1245	
gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc	5593
Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser	
1250 1255 1260	
ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag	5641
Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu	
1265 1270 1275 1280	
tac gtg gag gtt acg cga gtg ggg gat ttc cac tac gtg acg ggc atg	5689
Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met	
1285 1290 1295	
acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc	5737
Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe	
1300 1305 1310	
ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc	5785
Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys	
1315 1320 1325	

aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa	5833
Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln	
1330 1335 1340	
tac ccg gtt ggg tca cag ctc cca tgc gag ccc gaa ctg gac gta gca	5881
Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Leu Asp Val Ala	
1345 1350 1355 1360	
gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg	5929
Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr	
1365 1370 1375	
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca	5977
Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser	
1380 1385 1390	
tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc	6025
Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr	
1395 1400 1405	
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg	6073
Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp	
1410 1415 1420	
cgg cag gag atg ggc ggg aac atc acc cgc gtg gag tca gag aat aag	6121
Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys	
1425 1430 1435 1440	
gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag	6169
Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu	
1445 1450 1455	
agg gaa gta tcc gtt ccg gcg gag atc ctg ccg agg tcc agg aaa ttc	6217
Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe	
1460 1465 1470	
cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg	6265
Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu	
1475 1480 1485	
tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg	6313
Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly	
1490 1495 1500	
tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca cgg agg	6361
Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg	
1505 1510 1515 1520	
aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg	6409
Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala	
1525 1530 1535	
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac	6457
Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp	

1540					1545					1550					
agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac	6505														
Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp															
1555 1560 1565															
gcg gga tcc gac gtt gag tgc tac tcc tcc atg ccc ccc ctt gag ggg	6553														
Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly															
1570 1575 1580															
gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc	6601														
Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser															
1585 1590 1595 1600															
gag gag gct agt gag gac gtc gtc tgc tgc tgc atg tcc tac aca tgg	6649														
Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp															
1605 1610 1615															
aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc	6697														
Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro															
1620 1625 1630															
atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat	6745														
Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr															
1635 1640 1645															
gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt	6793														
Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe															
1650 1655 1660															
gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag	6841														
Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu															
1665 1670 1675 1680															
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag	6889														
Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu															
1685 1690 1695															
gaa gcc tgt aag ctg acg ccc cca cat tgc gcc aga tct aaa ttt ggc	6937														
Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly															
1700 1705 1710															
tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac	6985														
Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His															
1715 1720 1725															
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att	7033														
Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile															
1730 1735 1740															
gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag	7081														
Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu															
1745 1750 1755 1760															
aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg	7129														

Lys Gly Gly Arg	Lys Pro Ala Arg	Leu Ile Val Phe Pro Asp	Leu Gly	
	1765	1770	1775	
gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc	7177			
Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu				
	1780	1785	1790	
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga	7225			
Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly				
	1795	1800	1805	
cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct	7273			
Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro				
	1810	1815	1820	
atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag	7321			
Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu				
	1825	1830	1835	1840
aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc	7369			
Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala				
	1845	1850	1855	
ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc	7417			
Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile				
	1860	1865	1870	
ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg	7465			
Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg				
	1875	1880	1885	
tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca	7513			
Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr				
	1890	1895	1900	
tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac	7561			
Cys Tyr Leu Lys Ala Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp				
	1905	1910	1915	1920
tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc	7609			
Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser				
	1925	1930	1935	
gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct	7657			
Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala				
	1940	1945	1950	
atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa tac	7705			
Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr				
	1955	1960	1965	
gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac	7753			
Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His				
	1970	1975	1980	

gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc	7801
Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr	
1985 1990 1995 2000	
ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc aat	7849
Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn	
2005 2010 2015	
tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg	7897
Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg	
2020 2025 2030	
atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa	7945
Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln	
2035 2040 2045	
ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att	7993
Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile	
2050 2055 2060	
gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc	8041
Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser	
2065 2070 2075 2080	
gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct	8089
Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala	
2085 2090 2095	
tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat	8137
Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His	
2100 2105 2110	
cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct	8185
Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala	
2115 2120 2125	
gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc	8233
Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu	
2130 2135 2140	
aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg	8281
Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp	
2145 2150 2155 2160	
ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt	8329
Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg	
2165 2170 2175	
gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg	8377
Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Leu Ser Val Gly	
2180 2185 2190	
gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca	8427
Val Gly Ile Tyr Leu Leu Pro Asn Arg *	
2195 2200	

ggccaatagg	ccatcctggt	tttttccctt	tttttttttc	tttttttttt	tttttttttt	8487
tttttttttt	ttttctcctt	tttttttcct	ctttttttcc	ttttctttcc	tttggtggct	8547
ccatcttagc	cctagtcacg	gctagctgtg	aaaggtccgt	gagccgcttg	actgcagaga	8607
gtgctgatac	tggcctctct	gcagatcaag	t			8638